

CHAPTER 3ACONCRETE FOR STRUCTURES3A-01. GENERAL

a. This chapter covers commonly encountered concrete work other than concrete paving, which is covered in chapter 2D. Specialized procedures such as pumpcrete, pressure grouting, shotcrete, pre-placed aggregate concrete, etc. are not covered.

b. QA Representatives are cautioned that contract requirements for concrete for a given job are contained in the drawings and specifications prepared for that job. Also, that contract requirements may change from job to job. There are many differences between the requirements for concrete for Civil Works construction and concrete for military construction, and between the requirements for concrete for large jobs and concrete for small jobs. This guide information will assist QC/QA representatives in preparation for the work phase and in the inspection process together with the knowledgeable application of the specification requirements for the individual job.

3A-02. RECORDS

a. In general, the records to be kept will be prescribed by the District. Some modifications of the records-keeping system may be in order because of conditions distinctive to a given project, but no such modifications should be made without the full knowledge and approval of your supervisor.

b. Check with your supervisor and be sure that you know what records you will be required to keep and that you fully understand the preparation of the various forms involved.

c. Enter the required information accurately, completely and promptly in these records.

3A-03. MATERIALSa. Sources

(1) At the Preparatory Phase Meeting, before starting concrete work, check:

(a) Has contractor given advance notice of source of materials?

(b) Have samples been furnished?

(c) Have mixes been established?

(d) Have tests been completed on air-entraining agent? On curing compound? Concrete placement conditions may be such as to require admixture other than air-entraining agent or calcium chloride. Has this admixture been tested and approved? Reduction of cement content for basic design mix is not permitted.

(e) Have shop drawings for steel reinforcement and embedded items been approved?

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(f) Does the aggregate meet the contract requirements?

(g) Has cement been tested? (If required)

(2) Check as work proceeds. Are test reports, mill certificates and other certificates of compliance on hand for all materials being used?

(3) Is cement the type specified?

b. Storage and Handling

(1) Cement

(a) Is cement transported from the mill to the mixing plant in weathertight containers?

(b) If intermediate storage is involved, is cement adequately protected from exposure to moisture during intermediate storage and in loading and unloading operations?

(c) Is storage at mixing plant weathertight and properly ventilated?

(d) Is sufficient storage capacity available?

(e) Is oldest cement used first?

(f) Has over-age cement, if any, been tested?

(g) If concrete supplier has other customers, are adequate precautions taken to see that cement tested and approved for your job by the Bureau of Standards or the Waterways Experiment Station is not being used in concrete delivered to others? That untested cement is not being used in concrete delivered to your job?

(h) Have arrangements been made to secure all cement from one manufacturer?

(i) Is the cement being used in the same sequence as it is being delivered?

(2) Where Pozzolan is used, be sure bin dividers are leakproof to assure no contamination of cement, permit use of Pozzolan of only one type and from one source with approved design mix. Double wall dividers will provide a positive method of avoiding contamination. Do not permit use of Pozzolan that is contaminated or damaged.

c. Forms

(1) General

(a) Use specified wood or metal prefabricated or jobsite fabricated units.

(b) Check fit-up and bracing to prevent deflection from line and grade.

(c) Check if forms are readily removable, as required.

(2) For concealed surfaces the concrete forms must be tight and sound.

(3) For exposed surfaces the forms will be:

(a) Made of like-new plywood or equivalent material in 4 by 5 foot sections.

(b) Same for form lining. Linings shall have solid backing.

(c) Round column forms shall be prefabricated seamless type.

(d) Check form panel sizes when joints must be located for architectural alignment.

(4) Metal forms retained-in-place for slabs:

(a) Factory fabricated units are required.

(b) Check shop drawings information on deflection against specified maximum deflection.

(c) Are forms hot-dip galvanized?

(d) Are forms ventilated type as required for lightweight concrete?

(5) Pan-form units for slabs.

(a) Is type of material approved? Use either prefabricated steel, hardboard or fiber-glass of specified thickness.

(b) Check for damaged units which would effect finished appearance of exposed ceilings.

(6) Form ties

(a) Must be removable or snap-off metal tie.

(b) Check for device which will leave a conical hole 1-inch deep at least 3/8-inch but not more than 1-inch in diameter into the concrete from its surfaces.

(c) Snap tie break-back from concrete surface will be at least 1-inch when surface is exposed, painted or given other treatments.

(7) Chamfering

(a) Check for corner molding in the form at exposed corners.

(b) A chamfer strip must be used unless another shape is required.

d. Miscellaneous Material

(1) Have the necessary materials such as inserts, slots, clips, anchor bolts, etc. been approved and are they on the job site prior to starting the concrete placement?

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(2) Has contractor received approval on materials he will use for capillary water barrier, vapor barrier, water proofing, reinforcing steel, expansion joint material, joint sealer, forming, curing, etc.?

(3) Stockpiles

(a) Are aggregate stockpile areas graded, drained and stabilized so that contamination will not occur?

(b) Are aggregate stockpiles separated so that intermixing does not occur? Are they built up to avoid segregation and contamination?

(c) Are aggregates conveyed from stockpiles to batching equipment by means which will avoid segregation and intermixing? Do not allow use of bulldozers or similar equipment.

(4) Water - Is the supply of water for mixing and curing protected against contamination?

(5) Admixtures

(a) Is air-entraining admixture protected against freezing during storage?

(b) Has over-age admixture, if any, been retested?

(c) Check accuracy of dispenser and correct dispersion of admixture.

3A-04. BATCHING AND MIXING

a. Equipment

(1) Are batch truck compartment free of leaks, with bulkheads high enough to prevent overflow?

(2) Do compartment gates and water valves close tightly?

(3) Are contractor-furnished test weights on hand?

(4) Check all scales and measuring devices.

(5) Are these checks repeated periodically, as frequently as necessary to insure that delivery of materials from the batching equipment is kept within the specified limits of accuracy?

(6) Are automatic cut-off devices adjusted so that accuracy of batching is kept within the specified limits?

(7) Check recording devices to see that the recorded weights are the same as the scale settings. (These should be checked at least daily--more frequent checking and adjustment may be necessary to keep this equipment recording accurately)

(8) Check batch sizes so that mixers will not be loaded beyond manufacturer\*s rated capacity.

(9) Is plant equipped with all required interlocks, in operating condition?

(10) Is dispenser for air-entraining agent arranged so that the agent is batched with the water? (Specifications may provide that the admixture shall be batched with the sand only in the case where the water is batched on the trucks. When the water is batched at a central batching plant, batch the admixture with the water. The fact that truck mixers may be used to mix and transport the concrete will not relieve the contractor from the requirement for batching the admixture with the water.) If admixture other than air-entraining agent is approved, ensure that the admixture is introduced separately into a portion of the mixing water.

(11) Check multiple-batch trucks used for dry batching. Are compartments of ample size and are gates tight so that there is no overflow or leakage between compartments? (Check when truck body is raised to highest dumping position.)

(12) Is mixing drum watertight?

(13) Are mixing drum and discharge chute clean and free of hardened concrete?

(14) Check mixing blade wear.

(15) Do water valves operate easily and shut off tight?

(16) Check revolution counter provided on each truck mixer.

(17) Is mixer equipped with discharge lock, adjusted so that required mixing time elapses? (Note that specified mixing times are minimum, and that additional mixing may be required if necessary to produce complete, uniform mixing.)

(18) Check mixer drum rotation speed as designated by the manufacturer.

b. Batching and Mixing Operations

(1) Check mixing time.

(2) Continually check for assurance of complete control over batching and mixing. Check volumes of material used in mix, mixing time, and other controlling features.

(3) Check moisture content of aggregates frequently. Adjust batch weights in accordance with variation in moisture content.

(4) Check gradations of aggregates frequently.

(5) Check visually the freshly mixed concrete (constant observation is desirable if inspection personnel are available) to see that uniformity is maintained.

(a) Any marked change from normal consistency or appearance indicates something wrong with batching or the mixing, and the concrete should not be accepted for placement.

(b) Record rejected batches carefully, with reasons for rejection, and report promptly to your supervisor.

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(6) Check slump and entrained air contents as often as necessary to provide record data prescribed by District or job policy, and oftener if necessary to confirm visual checks.

### 3A-05. PRE-PLACEMENT INSPECTION

Check all of the following prior to each placement—placing should not be permitted to start until all are satisfactory.

#### a. Sample Concrete Panel

(1) Approved panel will be representative of quality required, including:

- (a) Formed surfaces and joints
- (b) Type of form ties
- (c) Patching, including color match
- (d) Smooth finish or special treatment
- (e) Structural joints and flashing treatment

(2) Erect with job mix design before structural formwork begins. Designate a protected location.

(3) Reject if unaccepted/approve in writing with minor correction noted, as applicable.

(4) Use in Preparatory and Initial Phase Meetings.

#### b. Footings and Foundations

(1) Have location, dimensions and grade been checked? Use grade stakes in unformed footings. Don't forget to pull stakes out after screeding.

(2) Has fill and/or capillary water barrier been compacted to specified density? Fill is prohibited to remedy over-excavation; thicken the footing/foundation.

(3) Are foundation excavations free from frost, ice or mud; moist as required but free from standing or running water?

(4) Has waterproof paper or polyethylene covering been applied to dry or pervious soils?

(5) Have precautions been taken to keep soil from contaminating concrete placed in unformed footing trenches?

(6) Is the ambient temperature in the permissible range?

#### c. Slabs on Grade

(1) Check for a capillary water barrier.

(2) Runs for electric conduit and piping systems must be located below the slab.

(3) Mud slab may be required as a working surface.

(4) Is the vapor barrier membrane of specified thickness? Is it sealed with tape at laps and penetrations?

(5) Are control joints layed-out as required so the maximum area of placement is not exceeded?

(6) Are isolation joints provided at columns?

d. Forms

(1) Line and Grade

Start with the footings and check for conformance.

(2) Joints

Check the face of forms for tightness to prevent loss of grout.

(3) Re-Used Formwork

Check for patching or plugging of all holes. Finish on the concrete will be no better than the face of the forms against which the concrete is placed.

(4) Materials and Procedures

Check to make sure that the form materials proposed will produce the specified end product. Also make sure that forming method and procedures will take place.

(5) Stud Spacing

The spacing should be uniform and such that no discernible deflection of the sheathing will take place.

(6) Walers

(a) Is spacing of walers staggered so as not to occur all in the same panel?

(b) Are splices in walers staggered so as not to occur all in the same panel?

(c) Is a continuous plate provided across tops of form panels or is there a waler located close enough to maintain good alignment at top of form?

(7) Tie-Rods and Spaces

(a) Is spacing sufficient to support load and maintain alignment? Are installed ties the specified type that can be withdrawn or broken off to leave no metal closer than the specified minimum distance from the concrete surface?

(b) Remember to remove temporary spacers from inside of forms as concrete is placed. Tie wire retrievers may be necessary on spacers beyond reach.

(8) Braces

(a) Has sufficient number been provided to maintain vertical alignment?

(b) See that all braces are at an angle of 45 degrees or less (interior) with the horizontal at the base of the brace.

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(c) If a series of braces originate from the same anchor point, are the braces tied together vertically half way between anchor form?

(9) Shores

Check that they are tied off in four directions at enough points to prevent bending or movement. After leveling the forms, have the shore wedges been nailed in position?

(10) Nailing

Check that enough nails have been used to hold each board or panel of the form of sheathing tight against studs or joists.

(11) Final checks

(a) Have forms been oiled, wetted or sealed as required? Check to see that surplus oil has been removed from forms and that there is no oil on steel reinforcement, construction joints or other surfaces where bond is required. Are forms clean prior to placing concrete?

(b) Check forms for movement which may occur during placing operation. Have measuring devices or reference lines been set up?

(c) Are all required chamfer strips and grade strips accurately aligned and securely fastened and protected?

(d) Have necessary clean-outs been provided for in the bottom of the forms? Are forms clean of debris?

e. Joints

(1) Are all joints (expansion, contraction, construction) located as shown on contract drawings or as otherwise approved? The criteria governing the location of joints not shown on the contract drawings are beyond the scope of this guide. The specification limits the area for slabs on grade and the length for walls which can be placed continuously without joints. Check these limits against the placement plan.

(2) Have construction joints at fresh concrete been prepared as required? Check requirements for air-water cutting, wet sand-blasting, roughening, wetting, etc.

(3) The location of bulkheads for construction joints in structural members, such as columns, beams or slabs, should be checked with your supervisor.

(4) Have the insert type contraction joints been coated with approved materials to break bond?

(5) Has preformed filler been installed and securely fastened in expansion joint locations?

(6) Are expansion joints free from irregularities or debris which would interfere with free movement?

(7) Check all joints which are intended to allow for expansion or contraction. No reinforcement or other fixed metal will be continuous through the joint.



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(8) Are water-stops firmly secured in Correct location, undamaged and spliced properly?

(9) If contractor has the option of sawing contraction joints after the concrete has set, and intends to exercise this option, have positive arrangements been made to have the locations of the joints laid out accurately, and to have approved sawing equipment and qualified operating personnel available at the proper time?

(10) Have the horizontal construction joints at fresh concrete been cleaned and dampened just prior to next placement?

f. Reinforcement

(1) Is all reinforcement positioned in accordance with approved shop drawings? Check bar diameters, bar lengths, lengths of splices, bar-to-bar spacing and clearances. Face tie wire ends away from forms.

(2) Watch for specialty items such as wall intersection bars, and additional bars around corners and at openings.

(3) Has reinforcement been cleaned of all loose, flaky, rust and scale, dried concrete, oil, grease or other foreign material which would reduce or prevent bond?

(4) Is reinforcement tied and supported securely so that displacement will not occur during concrete placement?

(5) Are reinforcement spacers, ties, plastic covered chairs, and supports as specified or approved?

(6) Precast concrete supports with tie wires will be used against the ground. Check for the specified clearance.

(7) Dowels will be positioned before concrete placement and not "stuck in" or positioned after placement.

g. Embedded Items

(1) Unless otherwise provided or approved, embedded items are to be fixed firmly in correct location before the concrete is placed and are to be embedded by placing the concrete around them. "Boxing out" to permit subsequent "grouting in" of embedded items will not be permitted unless specifically called for by the drawings, specifications or special approval.

(2) In case of a conflict in locations of embedded items with steel reinforcement, the relocation of embedded items or cutting, bending, addition, displacement or omission of steel reinforcement will only be permitted with the approval of your supervisor.

(3) Are all embedded items in place? Check mechanical and electrical drawings and approved shop drawings for mechanical and electrical equipment, for requirements for anchor slots end bolts, piping, sleeves, conduits, boxes, reglets, etc. which do not often appear on architectural and structural drawings.

(4) Are embedded items protected against damage during or subsequent to placement of concrete? Examples: Bolt threads and

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machine or polished surface covered; light metal sleeves or boxes braced internally; open pipes or conduits capped or plugged.

(5) It is often helpful to use a checklist when checking for embedded items. A sleeve placement drawing is a good idea and many projects require its preparation to avoid errors.

h. Miscellaneous preparations

(1) Have satisfactory arrangements been made to get concrete into all parts of the placement without segregation, loss of ingredients, formation of air pockets or cold joints? Check for vertical drops in excess of permissible limit. Do not permit "running" of concrete by means of the vibrator. Check for placement within the maximum time allowed after mixing. This time varies with ambient temperature.

(a) Is conveying equipment (i.e. crane, buggies, truck mixers, pumpcrete pipe, etc.) capable of reaching all parts of the placement?

(b) Are temporary form openings, tramies, chutes, conveyors or other special equipment provided as necessary and approved?

(c) Are "pockets" vented so that air will not be trapped?

(2) Are sufficient personnel available?

(3) Are all necessary tools on hand and in working conditions? Check especially: vibrators, including a standby vibrator and finishing tools.

(4) Have arrangements been made, and is all necessary equipment on hand and in working order to provide curing and protection including cold weather protection if needed?

(5) Are safe access and footing provided by means of ladders, platforms, walkways and stagings conforming to Safety and Health Requirements. EM 385-1-1?

(6) Review the testing plans to be made at the concrete plant and placement area during placement operation.

(7) The rate of placing the concrete will be directly dependent upon the adequacy of the preparations. If it is evident that the preparatory work will not insure placement of each batch of concrete within the specified time after mixing, and at such a rate as to prevent the formation of cold joints, the placement shall not be permitted to start.

(8) Has the contractor made arrangements to make cylinders or beams to test the strength of the concrete at least once a day, and have provisions been made to properly make, handle, and cure the specimens? Is equipment and manpower available for slump tests and air tests?

3A-06. CONVEYING AND PLACING

a. Equipment

(1) Is equipment clean and operable?

(2) Is pump and hose adequate and of required capacity and material?

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(3) Are there the required screeds and strike-offs and is a 10-foot straight-edge available to check finish slab tolerances?

b. Operations

(1) Check requirements pertaining to placing fresh concrete on concrete which has set. It may be required that the old surface be covered by a layer of fresh mortar, or that the old surface receive a slush coat of neat cement grout followed by specified topping.

(2) Is the time between completion of mixing and placement in final position in the form within the time allowed by the specifications? Is the concrete temperature at placement within the specified limits?

(3) Check method of placement during handling of concrete to prevent segregation. Check height concrete is allowed to drop freely, and method used to guide concrete into place.

(4) Is concrete placed rapidly enough to avoid formation of cold joints?

(5) Chutes, except for truck-mixer equipment, are not permitted for use in conveying concrete.

(6) Are layers of concrete maintained approximately horizontal and not exceeding specified thickness?

(7) Are form ties and supports checked frequently and adjusted as necessary to prevent or correct movement of the form?

(8) Is rate of placement within safe limits, such that forms will not be over-stressed by too-rapid rise of fluid concrete?

(9) Is each layer of concrete vibrated until fully consolidated?

(a) Insert vibrators vertically, through the full depth of each layer, at uniformly spaced points so circles of visible influence of the vibrators overlap.

(b) Do not allow vibration to be overdone to the extent of promoting segregation, and remember that vibrators are not to be used to transport concrete in the forms.

(10) The use of form vibrators is prohibited by some specifications and permitted by others, subject to specific approval. Do not allow their use except as approved.

(11) Check use of hand compaction tools insofar as practicable to assist in obtaining smooth, dense surfaces. Use hand compaction or vibrating screeds to consolidate thin slabs. Unless high slump concrete is specifically designed and approved, such as for thin, reinforcement walls, all concrete must be consolidated by hand compaction tools or vibrator.

(12) Do not allow excessive working of the concrete surface in completing a lift. Allow only enough to completely embed the coarse aggregate.

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(13) When pump delivery is used, concrete six must be designed accordingly.

### 3A-07. REMOVAL OF FORMS

#### a. Inspection Practice

(1) Is care being taken to assure that concrete is sufficiently hard and strong before removal of forms? Check specifications for minimum time and strength test requirements.

(2) Check to see that forms used for curing are left in place until expiration of required curing period. Forms shall be maintained "snug" against concrete surfaces at all times while using as curing means.

(3) For best patching results, forms should be removed as soon as practical and patching should immediately be accomplished so that patches cure with parent concrete. Specifications usually limit the time for form removal and patching to first 24 hours after form removal.

(4) Check to determine that form removal operation does not injure the concrete.

(5) Are you certain that all wood forms are being removed, especially in hidden places?

#### b. Method of Removal

(1) Is spalling of concrete being avoided during the form removal operation? Use methods which will avoid spalling, chipping and gouging.

(2) Form removal can be extremely hazardous. See that this operation is performed in a safe manner.

### 3A-08. FINISHING

#### a. Formed Surfaces

(1) Check the type of finish required.

(2) Has the contractor constructed and received approval of sample panels to show the surface finishes required? Note that the placing of concrete represented by each sample is not to proceed until sample panel has been approved.

(3) Repairing of defective areas and removal of fins, form marks and holes are required to be done immediately upon removal of forms.

(4) Check the cleaning of areas to be patched. Have honeycomb and rock pockets been cut back to solid material? Has loose material been removed?

(5) Check the requirements for the treatment of areas containing defective concrete.

(6) Check for complete curing of patched areas.

(7) Check surface for specified smoothness tolerances. Require rough areas and high spots to be ground smooth.

b. Unformed Surfaces

(1) Check the type of finish required.

(2) The working of the concrete surface should be the minimum that is necessary to produce mortar which is just sufficient for finishing.

(3) Insure that the screed runs are set to grade.

(4) Check to see that floating is started as soon as the screeded surface has stiffened sufficiently to permit floating without drawing excessive mortar to the surface. (There should be no free water on the surface at the start of floating. Dusting with cement or other material to dry the surface or to enrich the mortar will not be permitted.)

(5) Troweling, if required, should be done as soon as the floated surface has hardened sufficiently to prevent drawing more mortar to the surface, but while the surface is still workable.

(6) Check to see that marks left on the surface by edging tools are erased by floating, troweling or other means to produce a finish matching that of the adjacent surface.

(7) Insure that the screed run supports are removed to proper depth, if they are metal, and in their entirety, if wood is used.

(8) Make sure the screed run voids are filled with good concrete and compacted.

(9) Straight-edge the plastic concrete after filling screed runs, just prior to initial floating.

(10) Check the surface for required smoothness tolerance.

c. Smooth Finish for Formed Surfaces

(1) Check the contract specifications for areas requiring a smooth finish.

(2) Make certain that cement grouting operation is not delayed, thus allowing the grout to age with the concrete.

(3) Has the contractor planned his operations whereby he can completely finish areas to natural breaks in the finished surface each day?

(4) Has the proper mixture of cements (regular and white) been used in the grout mixture to blend with color of the finished surface?

(5) Is grout being applied so as to fill all pits, voids, and surface holes solidly?

(6) Is the excess grout being scraped off at the proper time with a trowel and is the flush surface then cleaned to remove any visible grout film?

(7) Is curing being planned so as not to allow grout to become dry during the setting period?

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(8) Has any loose dry grout been left on the surface? All surface grout must be removed with the trowel edge in the scraping operation.

d. Rubbed Finish

(1) Check for exterior exposed-to-view areas requiring rubbed finish. This may be specified as an architectural finish.

(2) Rubbed finish is performed after the surface has received a smooth finish. Rubbed finish is rubbed with carborundum stones and water.

(3) Check to see that no mortar or grout is being used during rubbing, and that all grout which has worked loose during rubbing is removed.

(4) Check to see that the rubbing operation removes all form marks and similar blemishes.

e. Monolithic Finish for Unformed Surfaces

(1) The ordinary finish for floors and roof slabs is the monolithic finish.

(2) Make sure that all coarse aggregate has been forced away from the surface before screeding and straight-edging begins.

(3) The timeliness of the floating and of the troweling is important. Make sure the surface is floated as soon as it will bear the weight of a man without deep imprint, and that it is troweled as soon as the moisture which was worked up from the floating operation has disappeared. Do not allow the addition of water or of dry cement.

(4) Check to see that the surface is steel-troweled to a smooth, even impervious finish, free from trowel marks.

(5) Check the requirement for the number of steel-trowelings.

(6) The specifications may require a separate concrete wearing course such as for industrial use, with the rough slab terminated below finish grade. Check for the specification requirements for the wearing course design mix, placement and finishing.

(7) Do not permit use of trowels cleaned in form oil, silicone, or similar bond-breaking materials unless such materials have been removed from trowel.

(8) Trowel-in abrasive aggregate at required locations for the non-slip finish.

3A-09. CURING. PROTECTION. AND FINISHING OF JOINTS

a. General

(1) Check the details of permissible methods and the number of days required for curing. Curing is the treatment given the concrete to insure that adequate moisture is available for hydration of the cement, with consequent gain in the strength and durability of the concrete.

(2) Protection is the treatment given the concrete to insure that neither its appearance nor its strength is impaired by running water, premature or excessive loading, blows, freezing, excessive heat, excessive temperature differentials within the concrete, etc.

b. Curing

(1) Is the approved curing medium being properly applied immediately after placing and/or finishing?

(2) Prevent use of membrane compound on concrete that is to receive paint, tile, roofing, hardner, etc, unless the curing compound is approved for this use. (See specs)

(3) Where moist curing is being used, is it continuous-not intermittent?

(4) Are wood forms which are left in place kept wet for the duration of the curing period?

(5) When waterproof paper or other approved covering is used, are laps and edges sealed? Is paper in full contact with surfaces being cured?

(6) Check when curing compound is used for adequate mixing and uniform coverage.

(7) Is the sprayed membrane:

(a) Continuous for full coverage and without discontinuities which will permit loss of moisture?

(b) Reapplied if subjected to heavy rainfall within 3 hours after application, or when damaged by subsequent construction operations at any time during the curing period?

(c) Protected, to avoid damage from pedestrian and vehicular traffic or any other cause which would disrupt the continuity of the membrane?

(d) Do not allow surfaces to dry. If concrete is surface dry, require moistener with fine spray of water before spraying with membrane.

(a) Are joints to receive sealant plugged to prevent coating with membrane curing compound?

c. Finishing of Joints

(1) Observe joints for proper dimensions.

(2) Make sure that the joints are clean and dry prior to sealing.

(3) Inspect the sealing of the joints. See that the joint is completely filled with sealer to finish flush with the surface and that all unsightly applications are corrected.

d. Protection

(1) Are precautions taken to protect surfaces from rain, snow or flowing water until they have set sufficiently to resist damage?

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(2) Determine requirements governing the time to remove forms and supports, and obtain instructions from your supervisor as to special conditions which may govern, such as strength of control specimens, special approval for earlier removal, or special requirements for deferring removal.

(3) Is adequate covering provided to protect concrete from damage by other construction activities? (Special attention must be given to corners, edges and projections which are not only especially susceptible to damage but are also most difficult to repair satisfactorily)

(4) Is loading controlled so that new concrete is not stressed beyond its strength? Examples: Backfilling against new walls; storage of materials on new floors.

(5) Check for coverings and heating equipment in cold weather as necessary to maintain temperatures. Temporary combustible coverings, including tarps, must be secured clear of heating equipment. Use of low density fibre board, insulation with combustible covers or vapor barriers must be prohibited. Heater fuel storage and arrangements for refueling should be carefully checked.

(6) Are min-max thermometers used to determine actual temperatures and to assure that temperatures for concrete protection are within required range?

(7) Check the removal of protection. Do not permit concrete to be subjected to sudden extreme change in temperature. A 25 degree F. differential in temperature between the concrete and the surrounding air is considered as the maximum.

### 3A-10. LIGHTWEIGHT CONCRETES

#### a. General

(1) Design mix required. Check aggregate manufacturers requirements in the approved submittal information.

(2) Check the special tests required for unit weights fresh and dry, for density control.

(3) Check for special mixing cycle and placing requirements.

#### b. Lightweight Structural

(1) Mostly the same procedures apply as for normal weight concrete.

(2) The aggregate manufacturer\*s qualified representative may be required at the worksite to assist in adjusting procedures to obtain the specified product.

(3) Check for the required control tests.

#### c. Lightweight Roof Fill

(1) This is used only over structural concrete decks. Check Chapter 3B for lightweight cast-in-place roof deck systems.



(2) Check for light steel trowel finish and curing as for normal weight concrete.

d. Lightweight Insulating Portland Cement Fill

(1) Check for required thickness and density to produce specified thermal "U" value.

(2) Is edge vented at perimeter of slabs?

(3) Are ventilating expansion joints provided at specified intervals? At edges and junctions with vertical surfaces and penetrations?

(4) Check required curing; membrane curing compound is prohibited.

(5) Check air-dry density test specimens for loss of weight sufficient to begin roofing.

e. Lightweight Insulating Asphaltic Fill

(1) Workmen and supervisor trained and experienced in this material are required.

(2) Check the manufacturer's written instructions and see that all procedures are complied with.

(3) Check for primed structural concrete deck and prime coat of asphalt at cold joints before continuing hot mix lay down.

(4) Check for "U" value density and required compaction to maintain that density. Make required density tests.

(5) check for required vented nailers.